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Astronomical Telegrams.

At the Council Meeting on 1892 April 8, attention was called to the suggestion recently made, that the Society should become an English centre for the distribution of astronomical telegrams. It did not appear desirable to consider any course of action independent of the already existing "Centralstelle für Astronomische Telegramme" at Kiel, and a letter from Prof. Krueger (printed below) was laid before the Council. It appeared that there would be some advantages in a scheme whereby the telegrams of the Centralstelle should be sent direct to the Society's rooms, and each then distributed by Mr. Wesley (or his deputy, when away) to such Fellows (or others) as became subscribers. But it seemed necessary that a preliminary inquiry should be made as to the number of possible or probable subscribers; and the Secretaries were accordingly instructed to draw up the present note, requesting those willing to subscribe to send their names to the Secretaries without delay, in order that the Council might then judge of the desirability of the scheme. The following is Prof. Krueger's letter, received in reply to an inquiry by the Secretaries:

"DEAR SIR,—I have been away for a few days, and am thus only able to answer your letter of March 28 to-day.

"There is no reason why the R.A.S. should not receive the telegrams of the Centralstelle for redistribution. But it must be made a condition that those persons or observatories who receive our telegrams through the R.A.S. take their share in the total expenses of the Centralstelle. This arrangement is already in existence with the Russian observatories. I only send telegrams (as regards Russia) to Pulkowa, and Pulkowa telegraphs on to all Russian observatories. At the end of the year it is calculated how much is spent on telegrams to Pulkowa; this is divided among the Russian subscribers, and, in addition, it is calculated how much each subscriber must pay towards the general expenses of the Institution.

"If the R.A.S. will undertake the part of an English centre, the subscription for the R.A.S. for the first year would be 3*l*., and 1*l*. for each subscriber who receives the telegrams. I assume that the Planet telegrams are not wanted, since no one in England has yet cared to follow these objects. If these were included, the subscription for the R.A.S. for the first year would be about 4*l*. For the next year the estimated subscription for the R.A.S. would be about 2*l*., and at most 1*l*. for the subscribers, again without minor Planets; otherwise 3*l*. to 4*l*. for the R.A.S.

"The more subscribers the cheaper will be the expenses of the Institution. An accurate calculation is made for each subscriber at the year's end, and an estimate made for the following

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year. The actual expenses have hitherto always been smaller than the estimated, and the excess is, of course, always credited in the next year. Under such an arrangement the R.A.S. must collect from the subscribers the cost of telegrams sent in England. I enclose forms for our telegrams; these could, if you wish, be translated into English. They have as yet been found suitable for the purpose, and would not be changed except for urgent occasions.

"It is much to be wished that the matter may soon be arranged; up to now Greenwich and Edinburgh are the only English subscribers, while a large part of the Continent, the United States, South America, Cape Town, Madras, and Melbourne are associates. If we could get a dozen observatories from England as new subscribers, the general expenses of the Institution would be reduced, and the success of the undertaking greatly enhanced.

"Should, however, the R.A.S. not care to undertake to be sub-centre for England, it is at least to be wished that English astronomers should be advised to join the Centralstelle in as large a number as possible. The annual cost is small, especially if no minor planets are wanted. I hope you will soon be able to send me news of the development of the scheme.

"Yours, &c.,

"To H. H. Turner, Esq. "A. KRUEGER.

"P.S.—If the R.A.S. takes over the distribution for England, it would be the simplest course to tell me how many subscribers you would have, and I would then estimate:—

"1. Cost of telegrams to the R.A.S.

"2. General expenses for R.A.S., and the individual subscribers.

"The R.A.S. could pay the whole to the Centralstelle and collect the shares from each subscriber, so that we should only deal with the R.A.S.

"Recently I have thought of another way of dealing:—That the R.A.S. should pay an annual fixed sum to the Centralstelle, and make its own arrangements with subscribers. But I cannot decide on this point, which must be reserved for the decision of the Committee."

If ten subscribers be found, the following would seem to be the advantages of this scheme compared with a direct subscription by each of the ten to the Centralstelle:—

1. The cost would be somewhat reduced, but not very materially. The reduction would be approximately the difference between the price of foreign telegrams and those of English, but not quite, for there is in each case one additional foreign telegram (to the R.A.S.) the cost of which must be shared by the ten subscribers. The contribution of each subscriber for the office

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expenses of the Centralstelle would be much the same as if he subscribed directly to the Centralstelle (if expenses incurred by the R.A.S. be distributed among the ten subscribers). But the reduction of the telegraphic expenses may be best shown by an example.

On an average twelve telegrams are sent from Kiel per annum with reference to the discovery of minor planets, and a like number with reference to the discovery of comets and other objects of interest; the average number of words in each telegram, exclusive of the address, being about fourteen. It is possible, as Prof. Krueger points out, to subscribe to the Centralstelle for all telegrams, or to have a partial subscription, in which case discoveries of minor planets are not notified. Supposing, then, that twelve telegrams, each of eighteen words (including address), were received during the year, the cost to a direct subscriber to the Centralstelle would be 216 × 2*d.* = 1*l.* 16*s.*; but to a subscriber through the R.A.S., if ten subscribers joined, it would be one-tenth of this (or 3*s.* 8*d.*) plus the cost of English telegrams = 9*s.*, or 12*s.* 8*d.* in all—a reduction of 1*l.* 3*s.* 4*d.*

2. The few German words used could be translated into English. But the telegrams are mainly in cipher.

3. English discoveries, communicated directly to the R. A. S., could be circulated immediately without passing through the Centralstelle.

The disadvantages would appear to be

1. The slight delay in re-distribution with possibility of accident to the main telegram.

2. The extra work and responsibility thrown on the paid Secretary of the Society (or his deputy). In view of these considerations, the Council will be guided in their decision to a great extent by the number of possible subscribers; and it is hoped that those interested will communicate with the Secretaries as soon as possible.

Note on the Lunar Theory. By Ernest W. Brown, M.A.

In determining the coefficients of the inequalities in the Moon's motion, which depend on the eccentricity and the ratio of the mean motions of the Sun and Moon, it is important to have the motion of the perigee of the Moon accurately determined. I have completed the determination of those coefficients which are of the form $e\,f\,(m)$, and in particular that part of the evection which is of the above form. The determination of the part of the motion of the Perigee required for this involves the solution of an infinite determinant. In vol. viii. of the *Acta Mathematica* Dr. Hill has, however, found a value for this